Amendments to the Claims

Please amend the claims as follows:

1. (currently amended) A method for training a neural network in order to optimize the structure of the neural network, wherein the neural network includes ~~determine risk functions for patients following a first occurrence of a predetermined disease on the basis of given training data records containing objectifiable and metrologically captured data relating to the medical condition of the patient, wherein the neural network comprises:~~

- an input layer having a plurality of input neurons that receive the input data,
- at least one intermediate layer having a plurality of intermediate neurons,
- an output layer having a plurality of output neurons that provide output signals, and
- a multiplicity of synapses, wherein each said synapse interconnects ~~which interconnect~~ two neurons of different layers ~~in each case~~, defining a sending direction from the input layer to the output layer,

wherein the method comprises:

~~characterized in that the training of the neural network comprises a structure simplification procedure, that is to say the location and elimination of~~ identifying and eliminating synapses that have no significant influence on the curve of the risk function, ~~in that~~ including

a1) ~~one selects~~ selecting ~~two~~ first and second sending neurons that are connected to ~~one and~~ the same receiving neuron by respective first and second synapses,

a2) assuming a correlation of response ~~one assumes that the~~ signals ~~output~~ from said first and second sending neurons to the same receiving neuron ~~essentially exhibit the same qualitative behavior, that is to say are correlated to one another~~,

a3) ~~one interrupts~~ interrupting the first synapse ~~of one of the two sending neurons to the receiving neuron~~ and ~~instead adapts~~ adapting in its place ~~accordingly the~~ a weight of the second synapse ~~of the respective other sending neuron to the receiving neuron~~,

a4) ~~one compares~~ comparing the ~~reaction~~ output signals of the neural network changed in accordance with ~~step~~ action a3) with the ~~reaction~~ output signals of the unchanged neural network, and

a5) if the ~~variation of the reaction~~ comparison result does not exceed a predetermined level, eliminating the first synapse ~~one decides to keep the change made in step a3)~~, thereby simplifying the structure of the neural network.

2. (currently amended) The method ~~as claimed in~~ of claim 1, ~~characterized in that the two~~ wherein the first and second selected sending neurons are located on ~~one and~~ the same layer.

3. (currently amended) The method ~~as claimed in~~ of claim 1, ~~characterized in that furthermore the~~ further comprising adapting a value of ~~the~~ a bias of the receiving neuron ~~is adapted in step~~ in action a3).

4. (currently amended) ~~A~~ The method ~~for training a neural network in accordance with the preamble of claim 1 and if desired with the characterizing parts~~ of claim 1, ~~characterized in that the training of the neural network comprises a structure simplification procedure, that is to say the location and elimination of synapses that have no significant influence on the curve of the risk function in that~~ wherein identifying synapses that have no significant influence on the curve of the risk function further includes

b1) selecting ~~one selects~~ a synapse,

b~~)~~2) assuming ~~one assumes~~ that said selected synapse does not have a significant influence on the curve of the risk function,

b~~)~~3) interrupting ~~one interrupts~~ said selected synapse,

b4) comparing ~~one compares~~ the ~~reaction~~ output signals of the neural network changed in accordance with ~~step~~ action b3) with the ~~reaction~~ output signals of the unchanged neural network, and

b5) if the ~~variation of the reaction~~ comparison result does not exceed a predetermined level, ~~one decides to keep the change made in step b3)~~ eliminating the selected synapse, further simplifying the structure of the neural network.

5. (currently amended) The method ~~as claimed in~~ of claim 4, further comprising

repeating the identifying and eliminating actions n times;

wherein comparing the output signals of the neural network changed in either of actions a3) and b3) with the output signals of the unchanged neural network includes

comparing the output signals of the neural network changed in either of actions a3) and b3) with the output signals of the neural network prior to performing the first identifying and eliminating actions, to provide a first comparison result; and

comparing the output signals of the neural network changed in either of actions a3) and b3) with the output signals of the neural network after performing the n-1st identifying and eliminating actions, to provide a second comparison result;

wherein the comparison result is a cumulative comparison result including the first comparison result and the second comparison result

~~characterized in that, when in the course of the structure simplification procedure n-1 synapses have already been eliminated and the strength of the influence of an nth synapse is being tested, the reaction of the neural network reduced by n synapses is not only compared with the reaction of a network reduced by only n-1 synapses, but also with the reaction of the neural network with its complete structure as present at the beginning of said structure simplification procedure, and in that the elimination of the nth synapse is only retained if the deviation of the reaction does not exceed a predetermined level for both comparisons~~.

6. (currently amended) The method ~~as claimed in~~ of claim 1, ~~characterized in that the~~ further comprising calculating a value of a likelihood function ~~is calculated~~ for the neural network to represent the ~~reaction~~ expected output of the neural network.

7. (currently amended) The method ~~as claimed in~~ of claim 1, ~~characterized in that the~~ further comprising comparing structure variants of the neural network ~~are compared~~ using a significance test.

8. (currently amended) The method ~~as claimed in~~ of claim 7, ~~characterized in that~~ wherein the structure variants of the neural network are compared using ~~the~~ a CHI-SQUARED test ~~which is known per se~~.

9. (currently amended) The method ~~as claimed in~~ of claim 7, ~~characterized in that~~ wherein the structure variants of the neural network are compared using ~~the~~ a BOOT-STRAPPING method ~~which is known per se~~.

10. (currently amended) The method ~~as claimed in~~ of claim ~~1~~7, ~~characterized in that, to compare~~ wherein comparing two structure variants of the neural network~~,~~ includes calculating the ratio of the values of the likelihood functions for said two structure variants ~~is calculated~~.

11. (currently amended) ~~A~~ The method ~~for training a neural network in accordance with the preamble of claim 1 and if desired with the characterizing parts~~ of claim 1, ~~characterized in that the training of the neural network comprises an optimization procedure in which the strengths of the individual synapses, that is to say~~ further comprising optimizing the strengths of the connections between the neurons~~, are~~

~~optimized, and in that the~~ according to a simplex method ~~which is known per se is used for said optimization~~.